

## **REMARKS**

### **Amendments**

Applicants have updated the related applications section to reflect recently issued patents. Claims 84 and 86 have been amended to correct typographical errors.

Independent claims 56, 64 and 69 have been amended to expressly recite the features of the cavitated fiber optic wafer; namely that the wafer is formed from a fused bundle of a individual optical fibers (See, page 36, 1<sup>st</sup> full paragraph). Each individual optical fiber has a diameter between 3 and 100  $\mu\text{m}$  (See, page 36, 1<sup>st</sup> full paragraph). The wafer has a top surface and a bottom surface, and the top surface contains at least 10,000 wells, each well being etched into the top surface of the cavitated fiber optic wafer (See, Page 6, line 16-23). The wafer has a thickness (between the top surface and the bottom surface) of between 0.5 mm and 5.0 mm (See, paragraph spanning pages 36 and 37). Finally, the depth of each well ranges from between one half the diameter of an individual optical fiber to three times the diameter of an individual optical fiber (See, page 37, lines 4-9).

Independent claims 56, 64 and 69 have also been amended to expressly recite that the wafer includes a plurality of beads (See, page 31, lines 21-29) each with a pyrophosphate sequencing reagent attached thereto (Id.).

Several new claims have been added to include a substrate that has a polished fiber optic surface opposite to the cavitated fiber optic surface (See, page 37, lines 21-23), wherein the cavitated surface may be coated (See, page 38, full page). There are also new claims that specify two pyrosequencing reagents – sulfurylase and luciferase. This is supported in the specification at p. 31, line 20. Also, claim 71 has been cancelled.

Each of the amendments and new claims are supported throughout the specification and claims. In addition, specific support are listed in parentheses above. The amended and new claims contain no new matter. Entry of these amendments are requested.

**Rejections under 35 U.S.C. §112**

The Examiner has rejected claims 84-87 under 35 U.S.C. 112, second paragraph, as allegedly indefinite. Further, the Examiner states that claim 84 lacks antecedent basis and claim 86 depends on a proceeding claim.

Applicants have corrected these defects by amendment and this rejection should be withdrawn.

**Rejection under 35 USC § 102**

The Examiner has rejected claims 56-58, 64-70, 72-78, and 84-87 under 35 U.S.C. 102(a) as allegedly anticipated by Walt et al. (WO 98/50782) ("Walt").

Applicants traverse. Each of the independent claims (and thus the claims that depend therefrom), as amended, show that the wafer contemplated here has a finite thickness between 0.5 mm and 5.0 mm, unlike the fibers in Walt – which are some three feet in length (see, e.g., Walt, p. 42, lines 13-14 and p. 44, lines 14-15). In addition, here the wells are constrained by specific width and depth requirements, absent in Walt. Finally, the wafer has disposed thereon a plurality of beads, each with a pyrophosphate sequencing reagent attached thereto. This feature too is absent in Walt.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Since the amended claims contains features neither expressly or inherently contained in Walt, there cannot be anticipation. Additionally for claims 84-87 there are still further features not present in Walt – and thus Walt cannot anticipate. The 102 rejection should be withdrawn.

**Rejection under 35 U.S.C. § 103**

The Examiner has rejected claims 56-87 under 35 U.S.C. 103(a) as allegedly unpatentable over Walt in light of Pantano et al., Chem. Mater., 8, pp. 2832-2835 (1996) ("Pantano"). Applicants traverse.

As discussed above, Walt does not teach or suggest the features of the wafer as expressly recited in the each of the amended independent claims (and thus the claims that depend therefrom). Pantano does not cure the deficiencies of Walt – in fact Pantano teaches away. Specifically, Pantano creates wells that do not fall within the diameter/depth requirements of the instant claims. Rather, Pantano's wells are much shallower than the instant wells. See Pantano, p. 2833 left column and p. 2834, left column, where the diameter of a well is 2.6  $\mu\text{m}$  and the depth is 300 nm – not within range recited here. See also Pantano p. 2834, right column where the well depth is only 50 nm. In short, the wells in Pantano are far smaller than contemplated here. For this reason alone, taking Walt in combination with Pantano, does not lead to the claimed invention. Nor does Pantano mention any wafer with the thickness dimensions specifically recited here. Finally, Pantano does not recite any beads disposed on the array. For these reasons too the combination fails.

With regard to claims 84-87, neither the Walt nor Pantano disclose a flow chamber or a fluid means for delivering pyrosequencing reagents – all of which are express limitations of claim 84-87.

The rejection of claims 56-70 and 72-83 should be withdrawn.

### **Provisional Double Patenting**

Claims 56, 57, 64-67, 69, 70, 73, 74, 76, 77, 84 and 85 stand provisionally rejected as allegedly unpatentable over copending Application No. 09/664,197. Applicants respectfully request that this provisional rejection be held in abeyance until a claim has been allowed here or in copending Application No. 09/664,197.

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**CONCLUSION**

Applicants believe that the claims as amended are patentable and a prompt allowance is respectfully requested.

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35437

PATENT TRADEMARK OFFICE

Respectfully submitted,

A handwritten signature in cursive script that reads "Eric Sinn". The signature is written in black ink and is positioned above a horizontal line.

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